



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## PROFESSOR CARPENTER'S REPLY

## I

Miss Richter was good enough to include in her article some calculations of mine by which I showed that the amphora and kalpis could be very simply measured off on a linear rule if (and, of course, only *if*) we allowed a workman's error averaging somewhat less than two millimeters. The suggestion was that the potter would measure off foot, bowl, neck, and so forth with a graduated rule, so as to get the elements of the vase into proportion. The rule was a rough approximation to a foot rule divided into sixteen dactyls.<sup>1</sup> The tables show that the dimensions of the two vases can be read off with such a foot rule in terms of simple numerical units, if we allow that the potter did not trouble to be perfectly exact. I dare say he worried more about getting his curves and lines to suit his eye than about following a purely mathematical precision. Even so, the table shows that he usually transgressed by very little more than a millimeter.

The suggestion of such a discrepancy is anathema to the Dynamic Symmetrists: well may it be, since they have pledged themselves to the ideal accuracies of geometry. Yet two millimeters is not much of an error. Miss Richter's own geometry is out by more than half that. In her Figure 1 the "dynamic ratio," on which the whole performance depends, is fixed at 1.236; yet 47.1 divided by 38.2 ("its height divided by its width") really yields 1.233—which means that the actual amphora is more than a millimeter too low for the dynamic scheme.<sup>2</sup>

Aristotle has here a wise and healing word. In *Eth. Nic.* 1098 a 27 he says, *χρή και τήν ακρίβειαν μή ὁμοίως ἐν ἅπασιν ἐπιζητεῖν, ἀλλ' ἐν ἐκάστοις κατὰ τήν ὑποκειμένην ὕλην και ἐπὶ τοσοῦτον ἐφ' ὅσον οἰκεῖον τῇ μεθόδῳ. και γάρ τέκτων και γεωμέτρης διαφερόντως ἐπιζητοῦσι τήν ὀρθήν. ὁ μὲν γάρ ἐφ' ὅσον χρησίμη πρὸς τὸ ἔργον, ὁ δὲ τί ἐστὶν ἡ ποῖόν τι.*

The minute accuracy demanded and delighted in by the Dynamic Symmetrists is a transference of modern scientific usage into a wholly irrelevant context. I doubt if very many people meas-

<sup>1</sup> The ancient potter had obviously no arithmetic to perform in this connection. The elaborate arithmetical calculations of which Miss Richter complains are wholly modern and (alas!) wholly mine.

<sup>2</sup>  $1.236 \times 38.2 = 47.215$ . In the kalpis of Fig. 3, 1.0557 should strictly be 1.0546, and 1.191 should be 1.192. These are trifling discrepancies, but they somewhat dim the lustre of an apparent three-place decimal accuracy.

ured anything accurately to the fraction of a millimeter before modern times. Miss Richter grants that even a photograph of a vase will not yield true measurements "for the simple reason that in an object of three dimensions you have to deal with perspective"; and yet this invisible accuracy is demanded for the vase itself.

## II

But it is of capital importance to realize that even if the potters did not measure off their vases in the way that I have suggested, *this is not the slightest proof that they used the method of designing by Dynamic Symmetry*. It is the strength of Mr. Hambidge's whole contention about Dynamic Symmetry that its employment in ancient times cannot be disproved; it is its weakness that it also cannot be proved. In that respect it rather resembles the Ptolemaic system of astronomy.

To keep to Miss Richter's excellent distinction between (1) the modern analyst, and (2) the ancient potter,

(1) Mr. Blake <sup>1</sup> and I tried to show (and I think on the whole we succeeded in showing) that the modern analyst's ability to furnish a satisfactory dynamic analysis for any or every Greek vase proved nothing whatever about the actual existence of Dynamic Symmetry as a practice of ancient Greek potters. Mr. Blake with an amusing (but I fear malicious) "root 13" of his own devising proceeded to show that there were not one, but many (he even suggested, mathematically innumerable) dynamic analyses for any given pot.

Once the probable analysis has been decided upon by the analyst, all other possibilities and potential constructions are, of course, eliminated, and we have

(2) The potter's supposed original scheme, which may be *comparatively* simple, as Miss Richter shows. So far, neither Dynamic Analyst nor skeptic has really proved anything at all about the ancient potter. I do not see that either of them ever can or will. If anyone is convinced of the cogency and rationality of fixing the points through which the outline of a vase is to run, by the processes which are advocated in (let us say) Figure 4 of Miss Richter's article, I think Miss Richter has (for that reader) won her case.

A few more specific matters invite comment:

<sup>1</sup> In *Art Bulletin*, March, 1921.

It is inadmissible to maintain that the dynamic proportions determine the curves. Through given points at base, handle, and neck, any number of different curves may be drawn.

The analogy between root 5 as it appears in the Hambidgean geometry of any given Greek vase and the underlying geometry of nature in *phyllotaxis*, proportional growth in shell-forms, etc., is not reputable. (Miss Richter does not press it.)

For the criticism that I have taken advantage of the small scale of my drawings, see the footnote to p. 32 and lines 2-3 of p. 34 of my previous article.

I must protest, wholly without rancor, that in her answers to my four "points" Miss Richter has neither met nor everywhere grasped the original arguments. But even that must be forgiven in an adversary who makes such delightful sallies as that against Mr. Blake for his "purely personal confession" that his eye cannot distinguish between rational and irrational quantities.

RHYS CARPENTER.

BRYN MAWR COLLEGE.

---

It is generally futile, as we know, to reply to a reply; the controversy might well be endless. If one's best ammunition has had so little effect, *τι νὰ κάμνωμεν*? But figures fortunately are figures, and perhaps I may be permitted to point out that (1) Professor Carpenter's "foot" rule—27.84 cm. in one case and 31.5 cm. in the other—not only does not tally with the Attic foot of 32.7 cm.,<sup>1</sup> but presents a variation of 3.66 cm. (or 36.6 mm.) in the two given cases. Can we really call this "approximation," rough or otherwise? (2) The fact that 47.1 cm., the height of the amphora Fig. 1, divided by 38.2 cm., its width, really yields 1.233 instead of 1.236 makes a difference, it is true, of 1.1 mm.; but this, if distributed between the two dimensions—as it naturally would be for the calculation of the ratio—means only a fraction of a millimeter. Everyone will allow that this is permissible; for the "minute accuracy" imputed to Dynamic Symmetrists by Professor Carpenter is not of their own contention. There is a golden mean, however, in pottery as elsewhere, between finicky and sloppy work.

GISELA M. A. RICHTER.

<sup>1</sup> Allowance for shrinkage does not help, since that would amount to about 10%.